

Hamidian A., Subramanian V., Doerner R., Shu R., Malignaggi A., Ali M.K., and Boeck G., "60 GHz Power Amplifier Utilizing 90 nm CMOS Technology," Radio-Frequency Integration Technology (RFIT), 2011 IEEE International Symposium on, pp. 73-76, Nov. 2011.

Abstract: This paper presents a fully integrated 60 GHz two stage power amplifier for wireless applications using common source topology and power combining. The PA is implemented in a 90 nm low power CMOS technology. The output power of the amplifier has been improved with the help of Wilkinson power combining technique. Also the Wilkinson power combiner has been utilized as a part of input and output matching networks to match the $16\ \Omega$ at the terminals of the power amplifier to $50\ \Omega$ at the output of the Wilkinson network. At 60 GHz the power amplifier achieves 11 dBm saturation output power, 9 dBm output power at 1dB gain compression point and more than 8 dB small signal gain with a peak power added efficiency of 6%. The broadband performance of the gain has been achieved utilizing the cascaded structures. The matching networks are based on high quality factor shielded coplanar transmission lines and fixed 300 fF MIM-capacitors. The detailed design procedure and the achieved measurement results are presented in this work.